

Environmental Reactor Facility for Geochemical and Biochemical Studies

Simulate abiotic or biotic processes associated with extreme environments under a range of temperatures and pressures.



Our laboratories have the capabilities to simulate a range of extraterrestrial environments. The unique set of facilities are supported by an experienced and highly qualified technical team.

We are seeking industry partners to co-develop this facility beyond its current TRL 4 as well as looking to collaborate with commercial and development partners through contract research, consultancy or Knowledge Transfer Partnerships.

The environmental reactor facility contains both flow-through and static reactors to study abiotic and biotic processes in open or closed systems. The reactors enable the study of the chemical changes that occur when fluids, silicates, and atmospheric gases are subjected to a range of temperatures and pressures.

Key features:

MMS 4566 flow-through reactor:

- 300 ml
- Ambient to 350 °C
- 0 bar to 70 bar

IM 4545 flow-through reactor:

- 600 ml
- -40°C to 200 °C
- 0 bar to 345 bar

25 ml and 100ml static reactors:

- -10°C to +450°C
- 0 MPa to 207 MPa

75ml static reactor:

- 350°C to 538°C
- 12.7 MPa to 58.6 MPa

Benefits:

- Bespoke gas mixtures in the reactor headspaces
- Continuous or intermittent sampling
- Simultaneously comparative experiments and analysis
- Anaerobic and sterile conditions

Applications:

- Aqueous alteration of minerals
- Mineral dissolution rates
- Oil, gas and mining industry
- Biochemical synthesis
- Materials science
- Ocean floor bioremediation
- Studies of ocean acidification
- Terraforming studies
- Simulations of planetary environments

AstrobiologyOU is a multidisciplinary research group that is working collaboratively to address the scientific, governance and ethical challenges associated with the advancement of astrobiology and related space exploration missions; whilst ensuring societal benefits and sustainability.

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